

12169

21112

3 Hours / 100 Marks

Seat No.

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- Instructions :** (1) All Questions are *compulsory*.
(2) Illustrate your answers with neat sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Assume suitable data, if necessary.
(5) Use of Non-programmable Electronic Pocket Calculator is permissible.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

1. (A) Attempt any THREE :

Marks

12

- State Faraday's Law of electromagnetic induction.
- Draw neat wiring diagram of turn indicator.
- Compare diode and zener diode with their characteristics and applications.
- The maximum flux density of 2200/110 V, 50 Hz transformer is 1.2 wb/m^2 . The net cross-section area of iron core is 100 cm^2 . Calculate the number of turns on low voltage and high voltage winding.

(B) Attempt any ONE :

6

- Explain the speed control methods of D.C. shunt and D.C. series motor.
- Define :
 - Magneto motive force
 - Reluctance
 - Flux density
 - Lenz's law
 - Reactive power in 1 ph A.C
 - Active power in AC.

P.T.O.

2. Attempt any FOUR :**16**

- (a) Classify the electric motors used in industry. State one specific application of each classified motor.
- (b) Explain the working of LVDT with neat sketch. State its applications.
- (c) Draw neat circuit diagram of full wave rectifier using two diodes. What is the function of filter circuit ?
- (d) Compare positive and negative return system. Why the earthing is used in automobile.
- (e) A series R – L circuit has $R = 10 \Omega$ and $L = .01$ Henry is connected across $v = 100\sqrt{2} \sin 100 \pi t$ volts. Find :
 - (i) Frequency
 - (ii) Impedence
 - (iii) R.M.S. current
 - (iv) Power
- (f) Explain the working of ultrasonic flowmeter with neat sketch.

3. Attempt any FOUR :**16**

- (a) What is principle on which thermocouple works ? Explain the working of thermopiles.
- (b) Draw the block diagram of A.C. timer and state the function of each block.
- (c) Explain the working of seven segment LED display.
- (d) State principle of electrodynamic instrument with neat circuit diagram. Is it unpolarised instrument ? Why ?
- (e) Draw symbols of NAND, NOR, AND OR gates. Explain true table.

4. (A) Attempt any THREE :

12

- (a) State Ohm's law. Using the same find e.m.f of battery in Fig. 1.

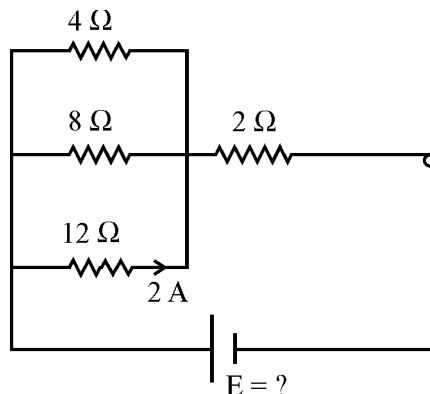


Fig. 1

- (b) Draw the symbol of S.C.R. Explain the working of SCR. What are its applications ?
- (c) What are the types of speedometer ? Explain the working of contactless electrical tachometer.
- (d) Draw wiring diagram using battery ignition circuit.

(B) Attempt any ONE :

6

- (a) Explain the working of strain gaugeload cell. What are its applications ?
- (b) Enlist the types of stepper motor. Explain the working of one type of stepper motor.

5. Attempt any FOUR :

16

- (a) Draw neat circuit diagram of power window. Explain its working.
- (b) An NPN transistor with $\alpha = 0.98$, $I_c = 2 \text{ mA}$ is used in CE configuration with $V_{cc} = 12 \text{ V}$. $R_c = 4 \text{ k}\Omega$. What is maximum value of base current required to drive the transistor in saturation ? Assume $V_{CE(\text{sat})} = 0.2 \text{ V}$
- (c) Explain the working principle with block diagram of encoder.
- (d) Explain construction of BJT transistor. State its application.
- (e) Define transducer. Classify the transducers. State the application of each.
- (f) (i) Draw torque / slip characteristics of 3 ph. Induction motor. Clearly indicate T_{st} , T_{mcx} and T_f .
- (ii) Draw Torque-speed characteristics of D.C. Series motor. Which is its very common application ? Why ?

6. Attempt any FOUR :**16**

- (a) What are the different photo devices ? Explain the working of LDR.
 - (b) Draw block diagram of multiplexer and demultiplexer. Explain its working.
 - (c) Draw neat circuit diagram of flip-flop circuit. Explain its working.
 - (d) State working principle of alternator. In what way D.C. Generator differ with alternator.
 - (e) Enlist the photoelectric type transducers. Explain one type of photoelectric transducer.
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